

Application No. 10/619,868
Amendment Dated September 9, 2004
In response to Office Action Dated May 14, 2004

REMARKS/ARGUMENTS

The Office Action mailed May 14, 2004, has been carefully considered by applicant. Reconsideration is respectfully requested in view of the foregoing claim amendments and the remarks that follow.

Allowable Claims

Claims 12 and 18 are indicated as allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

By the present Amendment, claims 12 and 18 are retained in dependent form in view of the fact that the amended independent claims upon which claims 12 and 18 depend are believed allowable for the reasons stated below.

Claim Rejections Under 35 USC §102 and §103

Claims 1-3, 7 and 13 have been rejected under 35 USC § 102(b) as being anticipated by Baker GB Patent No. 2,029,005. Claims 4-6 and 16 have been rejected under 35 USC § 103(a) as being unpatentable over Baker '005 in view of Khotyaints U.S.S.R. Patent No. 1372189. Claims 8-11 and 17 have been rejected under 35 USC § 103(a) as being unpatentable over Baker '005 in view of Smith U.S. Patent No. 4,956,560. Claims 14 and 15 have been rejected under 35 USC § 103(a) as being unpatentable over Baker '005 in view of Hastbacka U.S. Patent No. 4,051,726.

The primary reference, Baker '005, teaches a fluid level indicator having a plurality of transparent slices (1) of part elliptical section. The slices are mounted together to form an elongate body (7), which is immersed in a fluid to determine the fluid's level. Each slice has a light emitting diode (5) and a photodiode (6) at the respective foci, with direct light being screened off by stops (9). As taught by Baker '005 on page 1, lines 41-52 and page 2, lines 1-11, Baker '005 discloses two embodiments to prevent cross-talk or interference between adjacent emitter/receiver pairs. The first embodiment, shown in Fig. 1, screens each pair from adjacent pairs. The second embodiment, shown in Fig 3., scans the respective pairs sequentially in time. Thus, Baker '005 clearly teaches that the emitters and receivers should be arranged in pairs and should operate independently of each other.

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By the present Amendment, the claims have been amended to more particularly define the subject matter of the present invention and render the same allowable over applied references. Claims 1-3, 7-9, 11-15, and 18 remain pending and are not anticipated by, nor rendered obvious by the applied references for at least the following reasons. Claims 4-6, 10, 16 and 17 are canceled, thus rendering the rejections regarding those claims moot. Claim 19 is added and is also not anticipated by, nor rendered obvious by the applied references for at least the following reasons

Claims 1 and 2

Claims 1 recites a level detector comprising a plurality of light emitting devices and a plurality of light receiving devices, wherein each light receiving device is operable to receive light via respective paths from at least two adjacent light emitting devices. Claim 2 recites a level detector wherein each light emitting device is operable to illuminate, via respective light paths, each of two adjacent light receiving devices. Advantageously, according to the invention of claims 1 and 2, the respective light paths can each be independently checked. This arrangement provides for greater resolution and/or requires a reduced number of devices. *See also, e.g.*, the present specification at page 4, lines 13-22.

Baker '005 fails to teach or suggest such an arrangement. More specifically, Baker '005 teaches that the emitters and receivers should be arranged in pairs and should operate independently of each other. Baker '005 neither teaches nor suggests "a circuit...arranged such that it can determine whether light is received via each of said [at least two] paths to each light receiving device" (or each of at least two paths from each light emitting device). The deficiency of the Baker '005 reference is not cured by the remaining prior art. More specifically, neither Kotyaints '189, Smith Jr. et al '560, nor Hastbacka '726 teach or suggest a level detector wherein the emitter illuminates at least two receivers and/or each receiver receives light from at least two emitters. The cited prior art, in combination, fails to teach or suggest the claimed circuit arranged such that it can determine whether light is received via each of the at least two paths to each light

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receiving device, or each of at least two paths from each light emitting device. As such, claims 1 and 2 are believed allowable.

Claim 3

Claim 3 depends directly from claim 2 and is thus also believed allowable for the reasons stated above, as well as the subject matter recited therein.

Claim 7

Claim 7 recites "a control circuit for deriving a reading from a light receiving device, the reading being dependent upon the relationship between an ambient measurement taken when no light emitting device is illuminating the light receiving device and an operational measurement taken when a light emitting device capable of illuminating the light receiving device is operating." Such an arrangement is neither taught nor suggested by the Baker '005 reference. Contrary to the Examiner's assertion, Baker '005 does not teach or suggest readings "based inherently on a difference between ambient (background) current and the increased current upon light reception." In contrast, according to Baker '005, each reading is carried out when an emitter is operated, and any receiver output generated at other times is irrelevant. There is certainly no suggestion in Baker '005 of taking "an ambient measurement" from a receiver when no light emitting device is illuminating the receiver. *See, e.g.,* the present application specification at page 5, line 21 to page 6, line 6.

The deficiency of the Baker '005 reference is not cured by the remaining prior art. More specifically, neither Kotyaints '189, Smith Jr. et al '560, nor Hastbacka '726 teach or suggest "a control circuit for deriving a reading from a light receiving device, the reading being dependent upon the relationship between an ambient measurement taken when no light emitting device is illuminating the light receiving device and an operational measurement taken when a light emitting device capable of illuminating the light receiving device is operating." As such, claim 7 is believed allowable.

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Claims 8, 9 and 11

Claims 8, 9 and 11 have been amended to depend directly or indirectly from claim 7, and therefore are believed allowable for the reasons set forth above, in addition to the detailed subject matter recited therein.

Claim 13

Claim 13 recites that the control circuit checks, "that at least one lower sensor also has an output indicating immersion". *See, e.g.*, the present specification at page 12, line 17 to page 13, line 2. This procedure avoids errors caused by drips erroneously indicating a higher level rather than the actual level. This is particularly valuable when using the search procedure of proposed new claim 19 (see also page 13, lines 3-8), which allows rapid level determination but is particularly subject to errors caused by drips. Such an arrangement is neither taught nor suggested by any of the applied references.

Claims 14 and 15

Claims 14 and 15 now depend directly or indirectly from claim 1 and therefore are believed allowable for the reasons stated above, as well as the subject matter recited therein.

Claim 19

Claim 19 has been added and depends from independent claim 13. Claim 19 is believed allowable for the reasons stated above, as well as the subject matter recited therein.

Conclusion

The present application is thus believed in condition for allowance with claims 1-3, 7-9, 11-15, 18 and 19. Such action is respectfully requested.

Respectfully submitted,

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